

ABSTRACT OF THE DISCLOSURE

A low-noise optical frequency converter uses a predetermined microwave electric signal to modulate an input light wave and output a light wave that includes a first-order upper-sideband or lower-sideband and a third-order lower-sideband or upper-sideband. The frequency converter modulates a light wave identical to the input light wave with a signal having a frequency that is three times that of the microwave signal, to form a first light wave having a first-order lower-sideband or upper-sideband. The first light wave is mixed with a second light wave having a first-order upper-sideband or lower-sideband and a third-order lower-sideband or upper-sideband, with a phase of the third-order lower-sideband or upper-sideband reversed to a phase of the first light wave, thereby suppressing third-order sidebands.